What is claimed is:

1. An apparatus for forming thin films, comprising:

a chamber for sequential formation of at least a first thin film and a second thin film on a substrate by an antenna type plasma CVD method; and

a residual material removal apparatus which removes from the chamber residual materials which have an effect on the properties of the second thin film, the residual materials resulting from a step of forming the first thin film of the plurality of thin films.

2. A method for forming thin films, comprising the steps of:

forming a plurality of thin films by the sequential formation of at least a first thin film and a second thin film on a substrate in one chamber by an antenna type plasma CVD method,

removing residual materials after a step for forming the first thin film, and

forming the second thin film after the step for removing residual materials.

3. A method for forming thin films according to claim 2, wherein

the second thin film is a semiconductor film, and

the residual materials are materials which inhibit the semiconductor properties of the second thin film.

4. A method for forming thin films according to claim 2, wherein the step of removing the residual materials inside a chamber is performed, and the step of removing the residual materials includes plasma cleaning which generates plasma in the vicinity of an array antenna.

5. A method for forming thin films according to claim 4, wherein the plasma cleaning is performed by hydrogen plasma.

6. A method for forming thin films according to claim 2, wherein the step of removing the residual materials inside a chamber includes a step of gas replacement.

7. A method for forming thin films according to claim 2, wherein the step of removing the residual materials inside a chamber includes a step of evacuation of the chamber.

8. A method for manufacturing a solar cell comprising the step of forming semiconductor thin films on a substrate by the method of forming thin films according to claim 2.

9. A solar cell manufactured by the method for manufacturing a solar cell according to claim 8.